HW 01: NC PROGRAMMING   NAME:_____

The following workpiece is to have a finishing pass around its periphery (see NC Programming Notes, Figure 1).
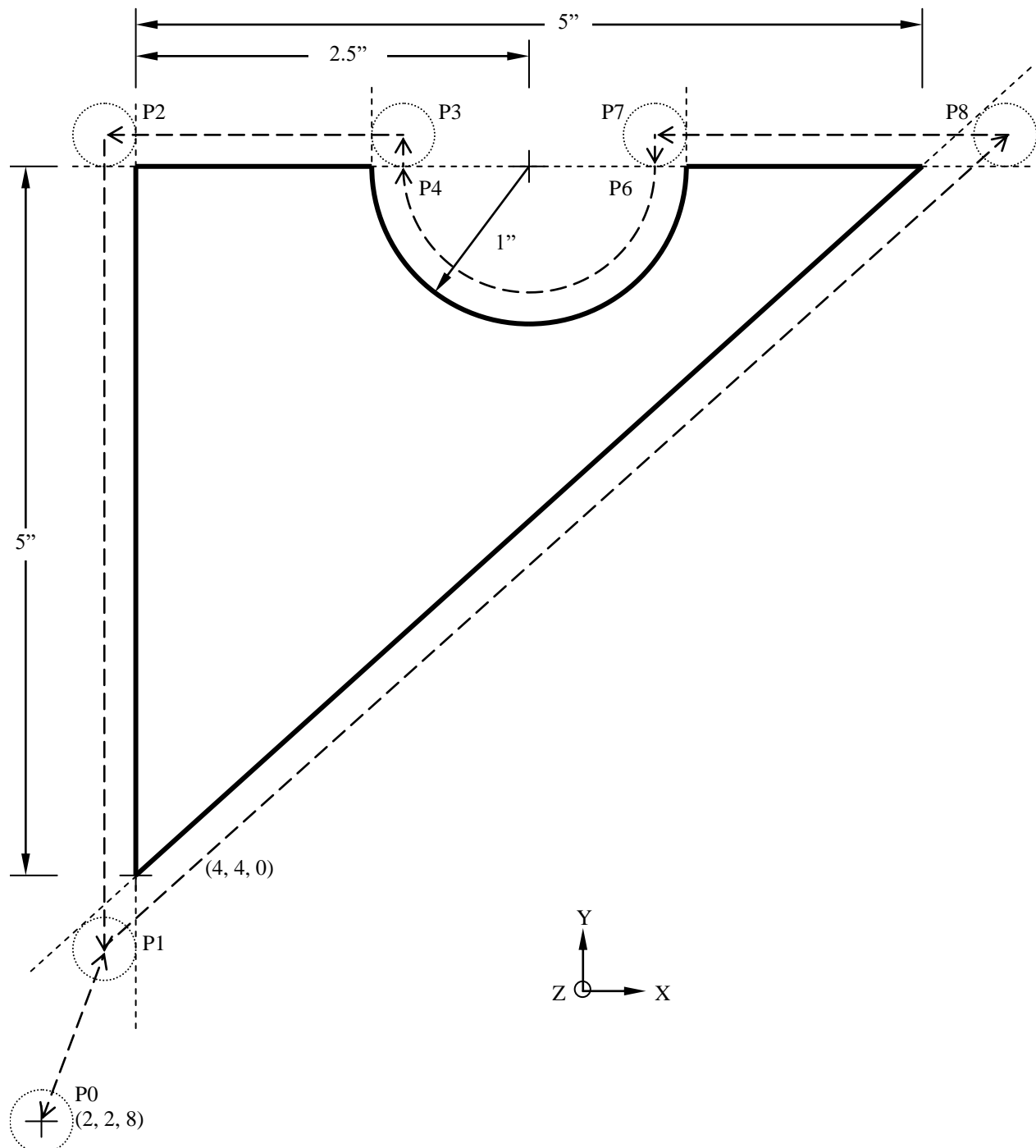

Figure 1. Workpiece for NC machining.

(HW questions are on the reverse side of this page.)

Questions:

1. Set up and create an NC program that profiles the part in Figure 1 in a counter-clockwise direction: (a) using full circle interpolation (i.e. use the points indicated, above); and (b) utilizes a coolant to flush chips from the surfaces.

    The pertinent machining data is: (a) cutter diameter is 0.25 inches; (b) feed rate is 6 inches per minute; (c) cutting speed is 300 surface feet per minute; (d) the tool home position is at (2, 2, 8); and (e) the part home position is at (4, 4, 0), referencing the lower, left corner of the top of the workpiece. (Adapted from Chang, T. C., Wysk, R. A., & Wang, H. P. (1991). *Computer-Aided Manufacturing.* Englewood Cliffs, NJ: Prentice-Hall. pp. 253-255.)

    Hint: You can save yourself a lot of geometry if you look at the __calculations__ on the NC Programming Handout

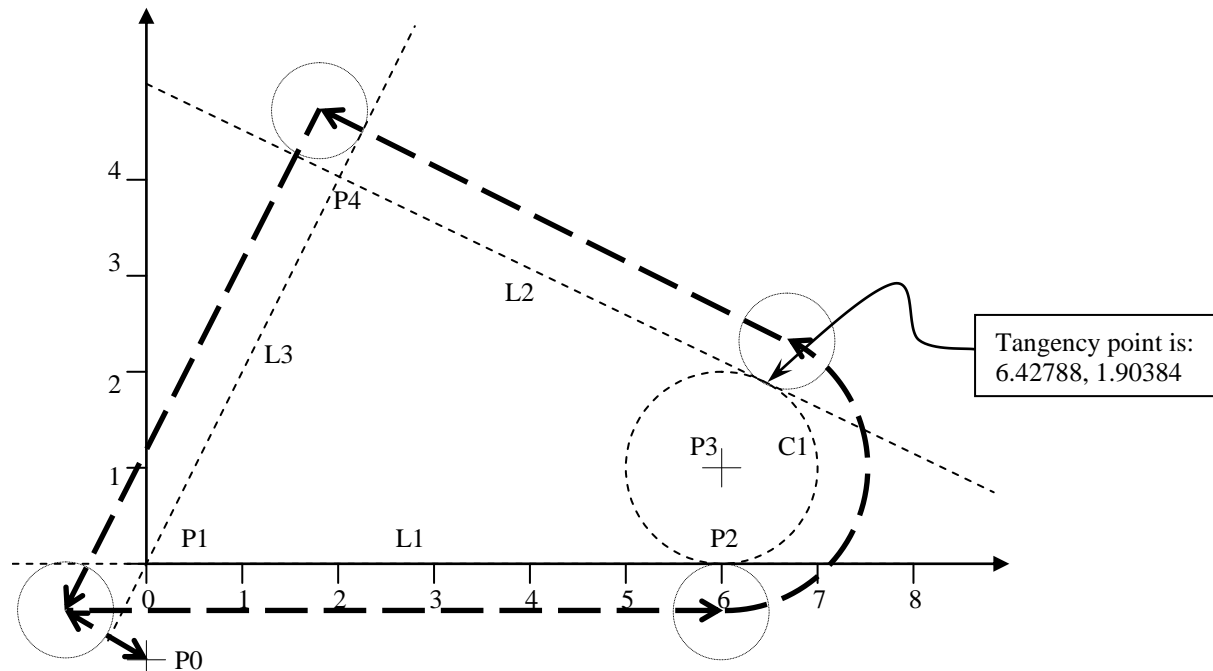
Tangency point is: 6.42788, 1.90384

Figure 2. APT Geometry and Tool Path for Workpiece

2. An NC program for the profiling of the part in Figure 2 (see the APT Programming Notes) is to be generated. (See the APT Programming Notes) The processing parameters are: (a) feed rate is 5.39 inches per minute; (b) spindle speed is 573 revolutions per minute; (c) a coolant is to be used to flush the chips; (d) the cutter diameter is to be 0.5 inches, and (e) the tool home position is (0, -1, 0). (Adapted from Groover, M. P. (1980). *Automation, Production Systems, and Computer-Aided Manufacturing.* Englewood Cliffs, NJ: Prentice-Hall. pp. 253-255.)

    Hint: You can save yourself a lot of work if you look at the program on the APT Programming Handout and look at the NC cutter compensation codes.

    Do your work on EP Paper, scan to pdf format and e-mail by the due date (Subject: IENG 475 HW 01).